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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/773,210	02/09/2004	Seiji Mizuno	10517/211	6749

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KENYON & KENYON LLP
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WASHINGTON, DC 20005

EXAMINER

MERCADO, JULIAN A

ART UNIT	PAPER NUMBER
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1745

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	04/26/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary	Application No. 10/773,210	Applicant(s) MIZUNO, SEIJI	
	Examiner Julian Mercado	Art Unit 1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
 Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
 Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. ____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>See Continuation Sheet</u> . | 6) <input type="checkbox"/> Other: ____. |

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :2005-09-19
2004-06-10 2004-02-09.

DETAILED ACTION

Drawings

The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

1. “line 100 to 100”, “line 200 to200”, “line 300 to 300” and “line 400 to 400” in paragraphs [0019-0025] are not included in the referenced Figures.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either “Replacement Sheet” or “New Sheet” pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1-18 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

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The terms “concave groove” and “convex rib” as used throughout all the claims, e.g. lines 3, 4, 7 and 8 in claim 1, are not clearly understood as use of these terms in the description are ambiguous. In Figure 4, reference character [18Ag] refers to a concave groove. In Figure 5, reference character [18Ap] refers to a convex rib. However, in view of Figures 4 and 5, it appears to the examiner that the concave groove and convex rib have *the same general shape*.

For purposes of claim interpretation, the claims have been given its broadest reasonable interpretation notwithstanding the terms “concave” and “convex”.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

Claims 1, 3, 4, 10, 12 and 13 are rejected under 35 U.S.C. 102(e) as being anticipated by Funatsu et al. (U.S. 2002/0168562 A1).

The applied reference has a common assignee with the instant application. Based upon the earlier effective U.S. filing date of the reference, it constitutes prior art under 35 U.S.C. 102(e). This rejection under 35 U.S.C. 102(e) might be overcome either by a showing under 37 CFR 1.132 that any invention disclosed but not claimed in the reference was derived from the inventor of this application and is thus not the invention “by another,” or by an appropriate showing under 37 CFR 1.131.

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For claims 1, 3, 4, 10, 12 and 13, Funatsu et al. teaches a fuel cell comprising at least one unit cell including a first separator which includes a plurality of first concave grooves, i.e. concave in shape relative to the surface which it contacts, which constitutes a first gas passage [54] for, e.g. oxygen-containing gas, and a plurality of first convex ribs, i.e. convex in shape in a manner not inconsistent with the first groove being concave, whose rear surface constitutes a first refrigerant passage [57], such as cooling water, and on which a first gas cross groove [54] is formed; the examiner notes that [54] references “gas channels 54 through which fuel gas (such as hydrogen gas) and oxidation gas (such as air) flow.” See par. [0022], [0085] and Figure 17. The same analysis applies for the opposite side of the membrane-electrode assembly, which has analogous structures. The examiner also notes that applicant’s specification in paragraph [0003] states that a refrigerant is “generally a coolant”.

As to an integral refrigerant passage having the claimed cross sectional area being formed “when a plurality of the first separators and a plurality of the second separators are stacked”, as this limitation is conditional on a plurality of first and second separators being positively present, this limitation has not been given patentable weight, as the present claims merely recite “at least one unit cell”. *Notwithstanding*, Funatsu et al. show a stacking configuration which results in an integral refrigerant passage [58] being formed. See Figure 19 and par. [0088] Thus, the patentees are considered to teach an *integral* refrigerant passage by virtue of the plurality of cells collectively defining a passage through which a refrigerant, such as water, enters.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5-9 and 14-18 are rejected under 35 U.S.C. 103(a) as obvious over Funatsu et al. (U.S. 2002/0168562 A1) in view of either Watkins et al. (U.S. Pat. 5,108,849) or Cavalca et al. (U.S. Pat. 5,686,199).

The teachings of Funatsu et al. are discussed above.

As to the particulars of separators relating to its depth, area, length, width and pitch, absent of unexpected results it is asserted that these are optimizable parameters for a result-effective variable. *In re Boesch*, 617 F.2d 272, 205 USPQ 215 (CCPA 1980) See, for example, Watkins et al. in col. 5 lines 38-43:

It will be appreciated that the aforementioned dimensions represent a compromise between electrochemical performance and the mechanical strength requirements for supporting the electrodes. Accordingly, the dimensions are variable within the stated ranges, depending upon the application.

See also Calvaca et al. in col. 9 line 10 et seq. under the heading "COMPARATIVE ANALYSIS", which factors in physical dimensions of a channel including its length, cross-section and shape, e.g. serpentine to calculate pressure drop calculation. Thus, the dimensions of the separators are deemed result-effective variables which directly affect mechanical integrity of the formed fuel cell and the uniformity of its reactant distribution.

Allowable Subject Matter

Claims 2 and 11 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record does not teach or suggest the instant invention regarding a first and second gas cross groove each of which cross-links at least two of the first concave grooves.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. U.S. Pat. 7,195,837 B2 to Suzuki et al., while not qualifying as prior art, is cited to teach a fuel cell comprising at least one unit cell including a first separator which includes a plurality of first concave grooves constituting a first gas passage [104] for, e.g. oxygen-containing gas, and a plurality of first convex ribs, i.e. convex in shape in a manner not inconsistent with the first groove being concave, whose rear surface [96] constitutes a first refrigerant passage, such as cooling water, and on which a first gas cross groove [100] is formed. See Figure 7 and col. 10 line 66 et seq.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Julian Mercado whose telephone number is (571) 272-1289. The examiner can normally be reached on Monday through Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Jan

STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700

